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THE WHITE WHALE.

BY

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THE WHITE WHALE.

The circumstances under which three White Whales have recently been brought alive to this country by the enterprise of Mr. Farini, and the difficulties that have been surmounted in the successful endeavour to exhibit them respectively at Westminster (by pre-arrangement with Mr. Wybrow Robertson), at Manchester, and at Blackpool, will be better understood, if, before mentioning the incidents connected with their capture and voyage, I describe the preparations made for the reception of the first White Whale successfully conveyed to England last year under the same auspices, and the result of that experiment.

Knowing something of aquarium specimens and the sensational advertisements by which their anticipated arrival is sometimes heralded, when I saw in the daily papers that "a whale" was on its way from America to the Royal Aquarium, Westminster, on board the North German Lloyd's steamer "Oder," which left New York on the 15th of September, 1877, I formed no great expectations of seeing a "monster of the deep." I thought of the laughable incident so charmingly told by Mr. Buckland in his "Curiosities of Natural History," of the "young, live, spouting whale," to purchase which for the Zoological Gardens he and Mr. Bartlett rushed off to Blackpool some years previously; and of its turning out to be "a poor little baby porpoise, about two and a half feet long;" and how my two friends "tossed up their hats, and lay supine on the shingle, and laughed at each other for five minutes that they should have travelled over two hundred miles to see such a wretched creature as that showman's 'whale'!"

But when I called at the Royal Aquarium, and Mr. Wybrow Robertson, the general manager, and Mr. Carrington, the naturalist and curator, with ready courtesy showed and explained to me the preparations that were being made for the reception of the American whale, I was convinced that they were getting ready for the advent of an animal of considerable magnitude. The clang of many hammers rang through the building with all the din of a boiler-maker's "shop," and when we entered the southern annexe, overlooked by the galleries of the restaurant, I came upon portable furnaces in full blast, and a little army of riveters engaged in constructing in the centre of the annexe an enormous vat of wrought-iron plates. As no tank in the Aquarium was nearly large enough for the accommodation of the expected guest, it was necessary to build one especially to contain it, and the rapidity with which this was done was really marvellous. This gigantic tank is forty feet long, twenty feet wide, and six feet deep, and it is calculated that it holds about 45,000 gallons of water, weighing 200 tons. The weight of the iron plates alone is thirty tons. Thirty thousand holes had to be drilled in them to receive 15,000 rivets, and yet this immense receptacle was commenced and finished within eleven days. It is rounded at the corners, and care was taken that no sharp edges or points should be left inside it which might injure the skin of its intended occupant, the bottom having been covered with Portland cement. Beneath it the earth was excavated to the depth of five feet, and into this

cavity the great fish-kettle was lowered as soon as the last plate had been made water-tight; so that it rests on a solid bottom, and its upper edge stands up about a foot above the level of the floor. Tiers of raised seats were erected at each end of the tank, from which visitors could look down upon the whale. A better view of the animal's movements in the water might, no doubt, have been obtained if the sides of the tank could have been of glass, and above the level of the floor, but this was quite impracticable. The unfortunate liability of the stoutest glass plates to crack, even when fitted in the most solid framework, would have rendered such a mode of construction dangerous, and, moreover, time and economy would not admit of its being adopted.

These costly preparations having so far advanced towards completion, there was leisure for anxiety concerning the condition of the illustrious voyager. Would it arrive alive, or would all the money and energy and enterprise expended on it prove to have been lavished in vain? As it was thought possible that the "Oder" might arrive at Southampton on Tuesday, the 26th, Mr. Farini, the *entrepreneur* of "Zazel," who, was interested in the speculation, went there on the previous day, accompanied by Mr. Carrington. A telegram was received from them on the Tuesday, at 7 p.m., just as the iron tank was being lowered on to its bed, that the ship had been reported in the Channel, and would arrive about five o'clock on Wednesday morning. Expectation was heightened, and the work hastened, for there was no time to be lost. Sympathising strongly with the experimenters, I was at the Aquarium early on Wednesday morning. I then learned that the gratifying intelligence had been received that the whale had been landed alive, and apparently uninjured, and that it would arrive at its destination about 11.30 a.m. On the arrival of the "Oder" off Netley, the animal was transferred, with other passengers and some specie, to the tender steamer, landed in Southampton Docks, and thence brought to London by the South-Western Railway, on an open truck, by the gentlemen I have named. The passage had fortunately been an extremely calm one.

About noon, a large wooden box, twelve feet in length, was lifted out of a van and placed at the side of the tank by a score or so of labourers. Within it lay the whale, half embedded in sea-weed—which smelt of anything but ozone—and breathing at intervals of about twenty-three seconds. Now arose a difficulty which might have been serious: it was discovered that the cement at the bottom of the tank had not set, and that it probably never would do so; for the water, though frequently changed, was thick with limy mud. From this dilemma Mr. Wybrow Robertson came out well. No hesitation nor indecision! Out with it; water, cement, and all! The water was run off, and every atom of the cement was scraped off the 800 square feet of the bottom of the tank; the iron plates were brushed and washed as clean as if no composition had ever been on them; the pure, clean water rushed in from taps and hose; and then we had to wait till the huge vat was full. The whole of the work was finished in about four hours from the time of the whale's arrival, and then came the crucial moment. A portion of the wooden case having been cut away, it was turned over, and the whale was gently dropped, sidelong, into the water. Although evidently cramped by its tedious confinement, it immediately began to swim around its pond. It remained, however, so long submerged without coming up to breathe that I began to fear that, owing to its being weak after its journey, and also possibly to the fresh-water being less dense and buoyant than the sea-water to which it had been accustomed, it was unable to rise to the surface. But presently up came the beautiful creature;

the blow-hole appeared just above the water, the breath was exhaled in a gentle puff, a fresh supply of air being at the same moment taken in, and then the whale descended in a graceful curve, to repeat these movements again and again as the necessary concomitants of its respiration. Many persons present expected to see it "spout." The fact is that no whales spout, and the idea that they do so is a popular error. Not a drop of water enters their lungs or is ejected from the blow-hole. They are obliged to come to the surface at intervals to breathe the atmospheric air. In this act the spiracle is normally brought above the water, the breath escapes, and the immediate inhalation is effected almost in silence. But sometimes the blow-hole is opened just below the surface, and then the outrush of air causes a splash upwards.

The blowing of the Beluga is said to be not unmusical at sea. When it takes place under water it often makes a peculiar sound, which might be mistaken for the whistling of a bird; hence one of the names given to it by sailors—the "sea canary."

To return to our whale. It was a female, nine feet in length, of a very interesting species, *Beluga catodon*, the Northern Beluga, or White Whale. The skin was creamy white, and the form very symmetrical. The broad and powerful tail and the whole build of the animal seemed in every way adapted to the rapid movement in water of which this species is known to be capable.

This whale was taken on the coast of Labrador, in a seine-net in shallow water, in the previous May, by Mr. Zach Coup, an American fisherman, who assisted in capturing the two specimens of the same kind which were swimming in the great tank in Mr. Barnum's Museum, New York, when that was burned in 1865. It was put on board a sloop for Montreal, thence travelled by railway to New York—a journey which occupied fourteen days—and until it was shipped for England, was kept in the aquarium reservoir at Coney Island, near New York. A large sum of money was paid for it, and I was shown a policy of insurance effected on it with the Paris Marine Insurance Company for £500, at eighteen guineas per cent. I suppose this was the first time the life of a whale had been assured. The result proved that the underwriters were justified in taking the risk. They made £90 profit on the transaction.

Some disappointment was expressed because the whale was not larger. The public must indeed be very exacting if it was not more than satisfied with that which it had an opportunity of seeing. Few people are aware of the great difficulty of bringing such an animal so far, and the unwearying, incessant attention it requires. This specimen was carried to this country under the care of Mr. Zach Coup, not in a tankful of water, but lying, as I have said, on a bed of wet *fucus* in a wooden box. Buckets of water were poured over this at frequent intervals, night and day, and the blow-hole and eyes were kept constantly moist; for if the latter had become dry it would probably have involved loss of vision. I was glad to see that the whale's sight was unimpaired. As it will only eat that which it finds and captures in water, this poor beast had nothing to eat during its voyage. The whole of the cetacea can, however, endure long abstinence from food without inconvenience. Immediately on its arrival a plentiful supply of live eels was placed in its tank, and as it soon found its appetite for its natural food, and chased and captured the eels with considerable activity, hopes were entertained that it would thrive in its new home.

But, alas! it lived there less than four days. On the Saturday morning, in response to a kind invitation to accompany Professor Flower to examine it, I was at the Royal Aquarium at ten o'clock, expecting to witness a lively and interesting scene. Mr. Carrington was ready to remove it from the water that some necessary work might be done in the tank. For this purpose he had had made a capacious hammock of canvas, which was to be passed under its huge body, and then hoisted up high and dry. But on my arrival there were grave faces around that tank, and when, instead of seeing the whale in graceful motion, I caught sight of its shapely body lying still and lifeless on its side, I know that there was as sorrowful an expression on my own countenance as on that of any one present; for, in truth, it was a bitter disappointment to all of us.

For more than one reason I viewed this unfortunate event with deep regret. The idea of bringing this great aquatic mammal alive across the Atlantic was so bold and plucky, the plan adopted for its transport was apparently so well chosen, and so carefully and skilfully carried out, and the preparations for its exhibition were so ample and complete, that I cordially sympathised with its owners and the authorities of the Aquarium in their loss. The public, too, were deprived of a great sight, from an educational point of view. Thousands of persons who had opportunities of seeing the porpoises in the Brighton Aquarium learned then for the first time to appreciate the fact that the cetacea are not fishes. They read with their own eyes from Nature's own book, far better than any printed page could teach them, that the whales breathe by lungs and not by gills; that they propel themselves by vertical movements of the tail and not by their pectoral fins; that they never spout water from their spiracle; and many other details of their movements, habits, and mode of life. And as they looked, and learned, and their interest increased with their understanding of the subject, they were taught that they had before them a warm-blooded animal that suckles its young, and one of high intelligence, almost, if not quite, equal in brain-power to the seals. And if this whale had lived, thousands more who never went to Brighton, and whose means or duties would not, perhaps, permit them to do so, would have learned similar lessons. Popular fallacies would have been dissipated, and popular knowledge increased.

The whale had died, I was told, about four o'clock that morning. Mr. Horne, the foreman of the Aquarium, informed me that he had been in attendance on it all night, and that at the time above mentioned, after turning occasionally on its side, and breathing unequally and laboriously for some hours previously, it struggled violently, made a sudden rush from one extremity of the tank to the other, as if in delirium, and breathed its last.

No sooner was it dead, than the eels, which had been placed in the tank for it to feed upon, began to nibble at its fins, and produced appearances which probably misled a right reverend cleric to make, on second-hand information, an erroneous statement in the *Times*, that it bore marks of ill-usage.

Now I do not wish to descend to bathos, but it is a fact that most of those present on that Saturday morning having been made the confidants of the hopes and fears of those who were pecuniarily interested in the undertaking, the feeling of regret was so universal and sincere that all looked on in blank concern, and for some time no attempt was made to remove the dead Beluga. Regrets, however, were useless, so the poor beast was hoisted out

of the water in the canvas sling in which it had been hoped it would rest comfortably during the cleaning of its tank, and placed upon a table for exhibition. During the day some sixteen hundred visitors, who had come to see the live whale, inspected it as it lay dead, and they saw a "show" which I, as a naturalist, may perhaps be thought to over-value, but it was one to see which I would have travelled a long distance, if necessary. At night a plaster mould of the whale was made by Mr. Searle, Mr. Buckland's secretary, and Mr. Buckland himself arrived from his journey of fishery inspection in Scotland in time to take part in the operation. He was accompanied by Mr. H. L. Rolfe, the renowned "fish artist," who kindly undertook to colour the cast gratuitously.

"Time and tide wait for no man," it is said; neither does animal decomposition; so it was arranged that a post-mortem examination of the whale should be made on the following morning. On entering the convenient and well-lit workroom of the Aquarium rather before the hour fixed upon, I found the deceased lying upon a tressel-supported board, and enveloped in a melancholy shroud of white plaster. This mould having been removed—not quite entire, unfortunately—Professor Flower commenced the dissection, and accepted the assistance of Mr. Bond, of the Westminster Hospital, Professor Garrod, Prosector to the Zoological Society, Mr. W. B. Tegetmeier, and myself. Mr. Wybrow Robertson and Mr. Carrington had everything in readiness for the operation, and, with Mr. Farini and other gentlemen, were present. The dissection necessarily occupied a considerable time—between three and four hours—and the patience of some of the on-lookers was, I fear, severely tested. But we had been requested to avoid injuring the skin or skeleton in any way which would prevent the one being stuffed and the other articulated for future exhibition; and to get at the several organs of a whale without lacerating them is not an easy matter, under such conditions. To hold back the tough india-rubber-like integument with its lining of blubber two inches thick required some exertion of strength, and we were glad to avail ourselves of about a dozen meat-hooks, by means of which, after the incision was made in the abdomen, the edges of the skin were kept apart.

The result of the examination was that the heart was healthy; a little serum was found in the pericardium, but nothing dangerous to life; the liver and kidneys were free from disease. In the œsophagus was found an eel, which shewed that the whale must have taken food very shortly before its death. In the stomach were the partially-dissolved remains of half-a-dozen other eels, on which the animal had very temperately fed; digestion had evidently gone on normally and satisfactorily, and there were no signs of the coats of the stomach having been affected by the long fast that had been sustained. The thickness of the blubber—from one and-a-half to two inches—showed that there had not been much wasting. The exterior surface of the lungs gave little indication of anything being wrong with them, but there was a lack of compressibility and elasticity under pressure of the hand, and when they were cut into the cause of death was at once revealed. "Plastic pneumonia" was immediately the verdict. It was evident that the animal had caught a severe cold, inflammation of the lungs had ensued, *pus* had formed in the cells and vessels, and death was the result. Although appearances might have led one to regard the disease as one of longer standing, Professor Garrod gave it as his decided opinion that it had probably commenced not more than a fortnight previously, dating, in fact,

from the time of the whale's shipment from New York. Professor Garrod's official experience of the after-death symptoms of disease in the larger mammals is, of course, very extensive; and he says that he has known this plastic, or grey pneumonia, to be fatal within nine days from its origin. In this case it was probably brought on by the whale being exposed to the air and to considerable vicissitudes of temperature, without the possibility of its blow-hole being submerged during its voyage. The constant *douche* bath to which it was, under the circumstances necessarily, subjected every three or four minutes, would, no doubt, aggravate this by causing evaporation from the skin, and thus producing unusual loss of heat.

In the lungs were a few thread-like worms, from three to five inches in length—apparently *Strongylus filaria*, a nematode generally found in the lungs of porpoises, even in those unaffected by disease.

The brain, which was healthy, was removed in excellent condition, and will be preserved in the Hunterian Museum. Its weight, as ascertained by Professor Flower, was sixty-three ounces, which is, as he remarks, about thirteen ounces more than the average adult male human brain, and therefore much larger than that of any land mammal except the elephant.* In addition to the two longitudinal furrows in which the inguinal mammæ are protected, there are two other similar but rather smaller fosses parallel with them, and about half-an-inch from them on the outer side. These do not communicate with any internal organ, and their use and purpose is not apparent. They may possibly indicate the position of two additional rudimentary teats. The dental formula was $\frac{8}{8}$ $\frac{8}{8}$, *i.e.*, there were eight teeth on each side of both the upper and lower jaws. Only the sharp points of these protruded through the gum; and it sometimes occurs that when, during the preservation of the skull, the gums are removed, other teeth are found to have been concealed by them, although above the level of the jaw-bone. The dentition of the Beluga is very variable. The teeth of one, of which the skeleton is in the Hunterian Museum, are $\frac{10}{9}$ $\frac{10}{9}$.

In most of the whales the seven cervical vertebræ are anchylosed, or united together, and incapable of separate movement, but in the Beluga they are free and unusually long, thus giving to the animal a longer and more flexible neck than is found in other species. This is worthy of note, because a similar structure in the Narwhal has been supposed to have been especially designed to enable it to wield its enormous tusk, or "horn." As neither the female Narwhal nor the Beluga have a tusk to wield, the explanation is unsatisfactory.

The Beluga has no real dorsal fin. It is represented, and the site it would occupy is indicated, by a slate-coloured arched ridge, about sixteen inches long, and not more than half an inch high at its most elevated part. This compressed protuberance seems to be formed by the skin, on which the epidermis is harder than elsewhere. The pectoral fins are oval, broad, and thick, and it is very evident that they can be of little use as propellors. The caudal fin, which is the locomotor, is deeply forked in its hinder edge.

* The question why an aquatic animal, in shape like a fish, and which seeks its food in the great waters as do the less highly organised predatory fishes, should be endowed with such great intelligence and a brain so capacious and convoluted, has, I know, presented itself to the minds of many thoughtful zoologists; but no man whose opinion is worth anything would, I believe, venture to offer an explanation of it. I certainly will not attempt to do so.

The orifice of the ear is almost imperceptible.

The size to which the Beluga attains has been much exaggerated. Lacépède gives it a length of from twenty feet to twenty-three feet, but it probably rarely or never exceeds sixteen feet. The longest skeleton I know of—that in the British Museum—measures only fifteen feet. Professor Flower kindly pointed out to me some time ago, in the Museum of the Royal College of Surgeons, the condition of the epiphyses of the bones in a Beluga's skeleton twelve feet six inches long, which showed that ossification was nearly complete, and therefore that the animal had all but reached its full growth. This first whale which lived in the Westminster Aquarium was about three-fourths grown. After its death I was able to take with precision a complete set of measurements, which were as follows:—

	Ft.	In.
Length from anterior edge of upper lip to notch in middle of caudal fin (following curve)	9	6
Total length in straight line	9	1
Length to notch in caudal fin	8	9
Anterior edge of upper lip to blow-hole (following curve)	1	3½
Anterior edge of upper lip to crown of rise of rudimentary dorsal fin (following curve)	4	10
Greatest girth behind pectoral fins	4	10
Angle of mouth to anterior angle of aperture of eye	0	3
Angle of mouth to orifice of eye	0	7⅜
Length of aperture of eye	0	1
Diameter of semi-circular blow-hole	0	2
Angle of mouth to centre of upper lip (following curve)	0	7½
Angle of mouth to snout, in straight line	0	6½
Angle of mouth to junction of pectoral fins with body	1	5½
Length of pectoral fins	1	1
Breadth of pectoral fins	0	7⅜
Breadth of caudal fin	1	11½
Vent to notch of caudal fin	2	4½

The owners of the whale, liberally presented, without charge or emolument, to Prof. Flower, for the Museum of which he is the distinguished chief and conservator, all the internal organs, and by their gift some interesting preparations were added to the collection of the Royal College of Surgeons. The skeleton was prepared by Mr. Gerrard, the well-known articulator to the British Museum, and on the following day I had the pleasure of assisting Mr. Buckland and Mr. Searle to cast the whale from the mould taken of it on the evening of its death. Our work was, as usual, rather laborious; but by "pegging away," as Abe Lincoln used to say, we accomplished our task in less than four hours; and if limbs were weary hearts were cheery, as jest and chaff flew about, and friends looked in upon us whose presence reminded us of former similar exploits with plaster of Paris; in which tubs, and pans, and bowls, and dishes, and pails, and mallets, and chisels, and white-bespattered whiskers, and queer costumes, and foaming tankards, had also been familiar accessories.

Amongst my most pleasant reminiscences of delightful recreations amidst the earnest work of an active and busy life, will always be those of my association with my genial and valued friend Frank Buckland in his casting and dissection of fishes and other animals. His collection of casts is already most valuable. The distinctive characters of each specimen are preserved with an absolute accuracy which no artist can represent in a drawing, and they will remain for reference and comparison as long as the plaster shall

endure. I often think that in the future, even more than now, his productions of this kind will be recognised as "philosophy in sport made science in earnest." *So mote it be!*

A great many inaccurate statements and unwise suggestions were made concerning the treatment of this whale. In justice to those responsible for it, I will notice two of these.

First, it was asked, "Why did they not make the box water-tight, and keep it full of water, instead of bringing the poor thing in damp weed?" Because those who undertook its conveyance knew that which inexperienced fault-finders did not know—namely, that if they had done this the whale would have been drowned within the first half-hour. It could not have raised its body to the surface for the purpose of breathing in such a position. To do this it requires depth and space to swim, and thus, by the propulsion of its tail, to rise obliquely, and similarly to descend. So, to bring the whale in water, a tank would have been requisite almost as large as that provided for it in the Aquarium; and if that had been practicable the water in it would have swashed about with every movement of the ship, and the animal would have been banged and bruised to death.

Secondly, it was objected that it was "absurd," "stupid," "ignorant," "the height of folly," etc., to expect it to live in fresh-water. I am not prepared to say that sea-water would not have been preferable; and I have no doubt that if a plentiful supply of this had been at hand the manager and naturalist of the Aquarium would have used it by choice. But neither am I at all sure that it was of the slightest consequence to the whale whether it was provided with salt-water or fresh-water. The cetacea do not breathe the air contained in water by gills as fishes do; it is merely the medium in which they swim, and whales of many species naturally take to fresh-water. For instance, the common porpoise to which the Beluga is closely allied, is often seen as far up the Thames as Chelsea; and the Beluga itself is in the habit of running up rivers, and is there caught as I described last week. Mr. W. H. Dall, of the Smithsonian Institution, gives an account of a Beluga being taken by the Russians in 1863, at Nulato, on the Yukon River, in Alaska, about 700 miles from the sea. Theoretically, therefore, these animals should exist equally well in salt or fresh water. But theory is not always in accord with practice, and it is possible that sea water may be more necessary for the well being of these aquatic animals than has been supposed. If salt water should, in future, be found preferable, "Tidman's Sea Salt" may be conveniently used for any of the cetacea.

Moreover, both of these much-blamed modes of treatment have been previously tried and found practically successful. Mr. Zach Coup, who assisted at the capture of this whale, and accompanied it to England, told me that he had kept others of the same species in fresh-water for months at a time; and Mr. Barnum mentions in his amusing autobiography, "Forty Years' Recollections" (a handsome copy of which he kindly presented to me in 1871), that in 1861 and 1862 three consignments of these White Whales—six in all—travelled from Elbow Island (*Ile aux Coudes*), in the River St. Lawrence, to New York, lying in a box on wet seaweed, and accompanied by an attendant who kept the blow-hole constantly moist during the long journey. One of these Belugas lived, and was publicly exhibited for two years in a water-tank in Mr. Barnum's museum. It was a male, ten feet long, and weighed 700 pounds. It became so tame that it would allow itself to be harnessed to a

car in which it drew a young lady round the tank. It learned to recognise its keeper, would allow itself to be handled, and at the proper time would come and put its head out of water to receive the harness, and take food from the hand. At times it showed a playful disposition, and amused itself by splashing about in the water and tossing stones in its mouth. It often took in its mouth a sturgeon and a small shark, which were confined in its tank, and, after playing with them for a while, allowed them to go unharmed. It was, however, less tractable than a bottle-nosed dolphin (*Delphinus tursio*), which was for a time its companion in the tank. Dr. Jeffries Wyman, Professor of Anatomy in Harvard College, communicated to the Boston Natural History Society in April and May, 1863, the above and other interesting particulars concerning this tame Beluga. They are recorded in the Society's Journal, vol. 7, p. 603.

As the tank in which Mr. Barnum's whale lived so long was smaller than that constructed for the whale at the Royal Aquarium, there was reasonable ground for believing that a Beluga would thrive as well at Westminster as in a New York Museum, or as the porpoises which lived for several months, and became so tame and docile, in the Brighton Aquarium. As a looker-on of some experience, I am satisfied that in the treatment of this "Westminster Whale" everything was done that foresight could dictate in the existing state of knowledge and skill in the carriage of living animals. "*Experientia docet*;" and improvements were devised, to be adopted on a future occasion. Meanwhile, the measure of success which was attained in the transport of this whale was distinctly in advance of anything of the kind that had been previously done or expected; and I still regard its safe conveyance as a great achievement, and one highly creditable to all concerned.

So far was Mr. Farini from being discouraged by the death of this whale, that no sooner was the breath out of its body than he exclaimed, "If I live till next year I will bring a dozen White Whales here if I want them." In the meantime, as the Beluga can only be conveniently taken at one season of the year, he sent Mr. Zach. Coup to Lerwick, with orders to capture, if possible, one or more specimens of the "Pilot Whale," which occasionally visits the northern islands of Scotland in vast herds. But, although in the endeavour to obtain a black whale if he could not procure a white one he incurred considerable expense, the weather was against him, and he was obliged to quietly "bide his time." The months soon passed away, the season came round again, and in due time he received intelligence that four White Whales would start on the 18th of May (1878), on board the Allan Line Steamer "Circassian." This vessel arrived at Liverpool on the morning of May 27th. Mr. Farini and Mr. Carrington, who were waiting there, boarded her in the Mersey, and found that three of the four whales were alive and vigorous, and that one had died during rough weather on the 24th, having been turned over in its box by a lurch of the vessel. Its blow-hole having been thus deprived of access to the air, it was suffocated. Of the three whales brought ashore alive, one was forwarded to the Pomona Gardens, Manchester, another to Blackpool; and the third, accompanied by Mr. Farini and Mr. Carrington, arrived safely at the Royal Aquarium, where it was met by Mr. Wybrow Robertson, Mr. Frank Buckland, and others, who, like myself, feel an interest in the experiment. The side of the box having been cut away, the whale rolled over into the great tank-ful of clear water with a mighty splash, and soon made itself at home in its new quarters.

These four whales were caught in the same locality, and conveyed in the same manner as the former one, under the care of Mr. Coup. That brought to London is rather larger than its predecessor. I am informed that Mr. Farini's agents have six more of these whales alive in a sea-pond on the coast of Labrador. They can be sent to him at short notice.

It has been generally supposed that the conveyance of the cetacea alive for long distances dates merely from the recent exhibition of them in the Zoological Gardens, and the New York, Brighton, and Westminster Aquaria; and many persons will be surprised to learn that in olden times it was not only occasionally accomplished, but that dolphins were thus regularly sent to market. Rondelet, who was governing physician of the University of Medicine at Montpelier, and wrote in 1558, referring to the dolphins, in controvertion of the statement of Pliny and Ovid,* that they die the moment they touch ground, makes us acquainted with a very interesting fact: "The female," he says, "of which I give the portrait at the head of this chapter, and which I dissected, lived out of water for some time after its capture, and dolphins have been carried alive from Languedoc to Lyons. Our fishermen, when they wish to convey them alive to a long distance, allow a little wine to trickle down the blowhole, which passes thence to the stomach." How the poor beast could endure this treatment without coughing, sputtering, and choking, or how the wine could pass from the spiracle to the stomach, I cannot understand. But if it was not beneficial, it seems to have done no harm, for from the nearest part of the coast of Languedoc to Lyons is 130 miles, and the carriage of a live dolphin thus far in the lumbering vehicles of those days, before the invention of railways, must have required skill, care, and persistent attention.

Rondelet does not mention the purpose for which the dolphins were taken from Languedoc to Lyons; but Aldrovandus ("De Piscibus," p. 712), quoting him as saying that they were conveyed alive to Lyons and Avignon, adds that they were regularly eaten by the "navvies" (*fossores*) and the lower orders of the people, because as they lived for a long time out of water, and their flesh was durable, they were less liable to putrefaction than fish sent on so long a journey.

The skin of the Beluga is not invariably creamy white, like that of the specimen brought to London. Captain Scoresby describes some which he saw as having been of a yellow colour approaching to orange, and others as tinged with a rosy hue. The young are bluish-grey, sometimes mottled with brown spots. Like the common porpoise, it is far from being a timid

* Ovid writes:—

"Quam postquam bibulis injecit fluctus arenis,
Unda simul miserum vitaque destituit."

Aristotle, with his amazing acquaintance with the habits of animals, knew better than that four hundred years before Pliny and Ovid published this error, for he wrote that "the dolphin is able to live for a long time out of water, groaning and panting in the act of breathing after the manner of whales;" and he adds, "in fact they can live longer out of water than in the water if they are prevented coming to the surface to breathe, for many are suffocated by being kept submerged when taken in nets, as not a few know." This was written 2200 years ago. To thousands of well-educated persons at the present day it would appear to be a startling discovery if stated as a newly-observed fact. Gesner mentions a dolphin taken at Ariminium which lived out of water for three days.

animal, when not hunted and persecuted. "Schools" of Beluga will often accompany a ship, and gambol round it for days. It preys on fishes of many kinds, but its favourite food is the squid (*Ommastrephes sagittatus*). Great quantities of the mandibles of this cephalopod, packed in masses, one within another, are generally found in the stomach of this and other whales.

The female produces one cub at a birth, and, like other whales, displays great affection for it. It follows all her movements, and does not quit her until it is of considerable size.

Information gathered from trustworthy sources leads me to believe that the annual migrations of the Beluga are so different from—in fact, so contrary to—those of almost all other whales, that further knowledge of its nomadic, but doubtless systematic roamings would be very interesting.

Dr. Robert Brown, F.L.S., in his "Memoir on the Mammalian Fauna of Greenland" (Proc. Zool. Soc., 1868), says that it winters in the Arctic Seas, and is only seen there from November till the end of May, and that during that period it is found in immense numbers crowding the broken places in the ice—spaces which remain open even in the most severe winter. He describes a scene of hundreds of White Whales and Narwhals protruding their heads at one of these holes—no other spot presenting itself for miles around—the eager struggles of the animals to keep their positions being such as to lead him to compare it to "an Arctic Black Hole of Calcutta." Hundreds of Esquimaux and Danes resorted thither with their dogs and sledges, and when one shot a whale, another harpooned it to prevent it being pushed aside by the anxious crowd of breathers. Dozens of White Whales and Narwhals were killed, but many were lost before they were got home by the ice breaking up soon after. In the ensuing summer the natives found many washed up in the bays and inlets around. Fabricius describes a similar scene. In these breathing-holes the White Whale often becomes the prey of the Polar bear, which by biting and clawing it every time it rises to breathe (which it must do at one spot, having no other to go to) soon exhausts and kills it.

In the month of June the Beluga leaves the coasts of Danish Greenland, south of 72 deg. N. lat., and, rounding Cape Farewell, visits the Gulf of St. Lawrence, and until the end of July is found in more or less abundance in the estuary of every important river along the coasts of Labrador and Hudson's Bay, between 53 deg. and 60 deg. N. lat. According to the Chevalier Charles Louis Giesecke, author of the article on "Greenland" in the "Edinburgh Encyclopædia," it runs up Davis's Strait in November, and then appears on the west coast of Greenland, usually arriving in vast herds—males and females together—in rough weather, with the wind from the south-west. Quite in accordance with this is an account given me by a friend of his having met with the Beluga in the North Atlantic in the month of October, on the passage from New York to England. No sooner had they struck the Gulf Stream, he says, than they fell in with "schools" of White Whales, which accompanied the ship for some days. The animals were probably shaping a north-easterly course towards Iceland and Spitzbergen. Captain Scoresby mentions having several times seen them near the latter island, but never in numbers of more than three or four at a time.

The Beluga is also found near Nova Zembla, and is very plentiful in the White Sea. A regular "fishery" of it is carried on in the spring and early summer at Solza, near the mouth of the River Dwina. Steller saw it also on

the coasts of Kamtschatka; so that it may be said to inhabit all the circumpolar seas.

It is remarkable that whilst other roving whales, like the migratory birds, seek a warmer temperature in lower latitudes on the approach of frost, the Beluga, on the contrary, prefers to pass the coldest season amidst the ice and gloom of the Arctic Seas, and the hottest months of the year in comparatively warm water, and under sunny skies. It thus exhibits greater capability of enduring a considerable range of temperature than any other whale. The Narwhal, its winter companion in the frozen seas, is rarely found south of 63 deg. N. lat., and the "Right Whale," or "Greenland Whale" (*Balæna mysticetus*), though it visits high latitudes in summer, commences its run southward about the end of August.

It cannot be said to belong to the British fauna, for only three instances are recorded of its having been seen on our coasts.*

In the third volume of the "Memoirs of the Wernerian Natural History Society" (p. 371) was published an account by Mr. (afterwards Dr.) Neill and Dr. Barclay, of a White Whale killed in the Frith of Forth in the month of June, 1815. Mr. Neill, who records therein the capture of the animal, says that for three months, during March, April, and May, 1815, it had been seen passing and repassing the harbour of Alloa, running up the Frith with the tide, and generally, but not always, returning with the ebb; and that it was supposed to be in pursuit of salmon. Many attempts were made to capture it, and it was at last killed, on the 5th of June, by a musket-ball in the lungs by the salmon-fishers near the Abbey of Cambuskenneth, Stirling. The specimen, which was a male, 13 feet 9 inches long, was purchased by Mr. Bald, of Alloa, and sent to Professor Jameson, Professor of Natural History and President of the Wernerian Society at Edinburgh. There an admirable water-colour drawing was made of it by Mr. Syme, the artist to the society, which drawing, as well as the whale itself, is preserved in the Edinburgh Museum of Science and Art. Dr. Barclay gave a full description of its anatomy, which was appended to Mr. Neill's account of its capture; and in illustration of their joint paper in the "Wernerian Memoirs," an engraving on copper was made by Lizars, which has been copied, with acknowledgment, by Captain Scoresby in 1820, by Sir William Jardine in 1837, by Mr. Bell in 1837 and 1874, and, without acknowledgment, by numerous compilers. This copper-plate, engraved by W. H. Lizars from Symes's drawing, made a few days before the Battle of Waterloo was fought, is now in my possession. It was presented to me by Dr. Robert Brown, F.L.S., to whose "Memoir on the Mammals of Greenland" I have already referred.

Mr. Neill, in the paper referred to, mentions that Colonel Imrie (also a member of the Wernerian Society), informed him that in August, 1793, he saw two young Belugas which had been cast upon the beach of the Pentland Firth, some miles to the east of Thurso. They were both males. The length of one was 7 feet, and of the other 7 feet 6 inches. The principal colour of their skin was white, but that was mottled with brownish-grey.

The third occurrence of the Beluga in Britain is recorded by Messrs. Baikie and Heddle in their "Historia Naturalis Orcadensis," where it is stated

* I am inclined to think, however, that some of the white whales mentioned by Mr. Couch as having been seen on the Cornish coast, were Belugas, and not albino individuals of another species, as he supposed.

that a dead White Whale was found stranded on the Island of Auskerry, one of the Orkneys, after a gale of easterly wind, in October, 1845.

Belugas generally advance in line of seldom more than two or three abreast, and more frequently in single file. Although they frequently follow the whaling boats in considerable numbers and play around them almost within reach of the harpoon, whalers seldom interfere with them. It is difficult to strike them on account of their great activity, and if the skin is pierced, it is so tender that the barbs generally draw out. Moreover, when the animal is secured, the blubber is not of sufficient value to pay the crew for their time, labour, and personal risk.

Dr. Rae, the well-known Arctic traveller, gives in one of the earlier volumes of "Land and Water" (vol. 5., p. 265) an interesting description of the manner in which the Beluga is taken and killed in various localities. In the St. Lawrence, and also the Moose River, a point of land is chosen near to which the "sea-pigs" have been observed passing down stream. From this point poles, barked to make them white, are stuck in the mud three or four feet from each other, and extending obliquely outwards and up stream for a greater or less distance, as may be required. They are then planted inward and down stream for a short way. The current sets these poles in motion, and the timid "porpoises," as they are locally called, being alarmed by this, do not break through the open fence, but pass along its course seeking for an outlet till they reach the *cul-de-sac* at the entrance of the enclosure, and thus continue to swim about till the water falls low enough to enable men to wade in and lance or shoot them. In Whale River, on the East Maine Coast, they are taken wholesale by strong nets shot completely across from bank to bank. As soon as they have passed up stream, these nets are secured by anchors and heavy stones, and buoyed up by casks. When the "porpoises" come back with the ebb-tide they find the passage blocked, and, before they can recover from their bewilderment, another net, previously sunk, is quickly raised and buoyed a short distance behind them. Great numbers are thus enclosed. About the year 1867 the idea of using fixed nets occurred to the Gulf (of St. Lawrence) Fishery Company, A net with a mesh over a foot square, and composed of rope fit for the running rigging of a ship was employed and was found to work well. I learn from the "Montreal Witness" that the first time it was set at Point á Carillon on a dark night sixteen Belugas and twenty-one sharks were meshed. They must have plunged a great deal, for six others had broken through the net and escaped. Such vast numbers of "white porpoises" collect in the season in that part of the Gulf that fifty to a hundred may be taken on a favourable night. In Hayes River, at York Factory, Hudson's Bay, the Indians shoot them from stages erected on poles. In the Churchill, a fine deep stream fully a mile across, none of the plans of destruction above mentioned would be successful. There the "porpoises" are harpooned from boats painted white, which sail amongst them, and being of the same colour as themselves cause little or no alarm. A harpooner is stationed at the head and stern of the boat, with a harpoon having a strong line attached. The water being beautifully clear, the porpoise is easily seen and often harpooned when a fathom or more below the surface. It does not run far in one direction, but darts about much as a startled salmon

or sea trout does when hooked, and is soon lanced, if required, but it generally dies quickly from the harpoon wound. The porpoise, when killed, is anchored and buoyed, and the boats then go on with their work, frequently killing four or five in a tide. The Esquimaux pursue them in their light kayaks, and use a harpoon to which an inflated sealskin is attached. When the whale is struck the floating air-bag impedes its movement through the water, and it is soon overtaken and killed by the lance. Sometimes two kayaks are fastened together to prevent them upsetting, and by retaining hold of the harpoon line the Esquimaux are towed along at a great pace.

To these northern people the Beluga is a very useful animal. The Danish Greenlanders watch anxiously for its periodical arrival, for it comes at a season when they are usually very short of provisions. The flesh, which is of a dark-red colour, is highly valued, and is said to be of excellent flavour. I have not had an opportunity of trying it, but I have eaten and relished that of the common porpoise, which, when broiled, tastes and looks so much like beef that many persons would fail to detect any difference between them. Sir Leopold McClintock shot a Beluga during his cruise in the "Fox," and says that its flesh was very palatable, and preferable to that of the seal, and Mr. John Ryder, the well-known actor, has told me that he often ate and enjoyed Beluga steaks during a voyage across the Atlantic in one of the American "liners." Worthy Hans Egede, the Danish missionary to Greenland, seems also to have had a keen tooth for a slice of White Whale, for he says: "His flesh, as well as the fat, has no bad taste; and when marinated with vinegar and salt, it is as well-tasted as any pork whatever. The fins also, and the tail, pickled and sauced, are very good eating; so that he is very good cheer." Commander Markham, in his "Whaling Cruise to Baffin's Bay," confirms this, and says that the tail, boiled and steeped in vinegar, is very palatable. The Greenlanders salt the fins of all the whales for future use, in case the supply of other food should fail, and also as much of the flesh as is not required for immediate consumption. This is a precaution taken at all the Hudson's Bay Company's posts, when deer, buffalo, fish, etc., cannot be got in sufficient quantities. The Esquimaux eat the meat raw.

The internal membranes, being translucent when stretched and dried, are used by them as a substitute for glass in the windows of their huts, and for other purposes, such as curtains for their tents, etc. The serous membrane of the intestines is so nicely prepared, that it nearly resembles "gold-beaters' skin." A musical instrument called "keeloun" is made by stretching the membranous skin of the whale's liver upon a wooden or whalebone hoop, about thirty inches in diameter. It is something like a tambourine, but the player holds it by a handle and strikes the hoop, not the membrane.

The sinews furnish most serviceable thread. When the four Laplanders and their reindeer were brought to London by Mr. Farini, and exhibited at the Westminster Aquarium in November, 1877, I had an opportunity of seeing this thread made by the women. A strip of sinew was drawn through the teeth several times, until the fibres separated and became like so much tow. These were drawn out in such a manner that the end of each was in a different part of the length; and then, after being drawn between the lips and wetted in the mouth, they were rolled upon the knee—sometimes

on the cheek—of the operator under the palm of the hand. Thus the thread was spun about a foot at a time and wound upon the fingers, the fine ends of each fresh portion being twisted in with those of the previous ones. The thread produced by this simple process is singularly fine, even, and strong, and would make a good substitute for gut-line for fishing purposes.

The blubber, which is from one and a half to three inches thick, and looks like pork fat, produces a very superior kind of oil, and it is said that a good deal of it is sold as cod-liver oil. Animal oils are now so skilfully treated and clarified, that much of their unpleasant odour and flavour may be removed, if they have not been allowed to become wholly or partly putrid before importation; and there is probably no more nutriment in the oil of the cod's liver than in that obtained from the blubber of the cetacea. The flavour of the latter in its crude state is, however, most nauseous, but there are some persons who find no difficulty in overcoming their dislike to it. I remember accompanying my father one day, when I was a youngster, to the Hudson's Bay Company's warehouse, whilst the miscellaneous products of their territories were on show previous to one of their periodical sales. There were bison tongues and reindeer tongues, goose-quills and feathers, walrus tusks and whalebone, isinglass and castorum, and, amongst the rest, seal-oil and whale-oil of various qualities, samples of which were arranged in phials on a table. They were as dark in colour as brown sherry, and the odour of them was rancid enough to make the air feel greasy; but, to my surprise, I saw a handsome old gentleman—a merchant of the old school—tasting them one after another with apparent gusto, and smacking his lips over each as he obtained its full flavour on tongue and palate, as if it were a glass of fine old port. Noticing the look of astonishment—perhaps of disgust—on my face, he turned to me and said with a smile, "Well, my lad, I suppose you think I am a nasty old fellow; but I assure you that these oils are not offensive to me. To taste them is my business, and I am used to it. *Egad, I like it!*" And the cheery old boy went on sipping away at his samples, and pondering over the taste of each, with his head on one side like a jackdaw in thought.

Mentioned last, but not the least useful portion of the Beluga, is its skin. This, as well as the tail and fins, is regarded as a delicacy, and is eaten either raw, dried, boiled, or pickled. It is said to be more delicate and tender than that of any other whale. But the skin of the *Mysticetus*, the Greenland, or Right Whale, is also a great treat to the Esquimaux. It is about three-quarters of an inch thick, and looks like solid india-rubber. Poor F. C. Hall, of the "Polaris," whilst in training with his Innuits in 1860-1862, was often obliged to subsist on it, and many entries in his diary tell of his appreciation of it. He says: "The 'black skin' is good eating in its raw state, as I know from experience. When boiled and soused in vinegar it is most excellent. When prepared as pigs' feet are in the States, it is luxurious. . . . . At supper I ate heartily of raw, frozen whale-hide. . . . . On rising I took two ounces of raw whale-skin for my breakfast; I would gladly have eaten two pounds, could I have had it." But if the skin of the Beluga is a tender and succulent viand when soused in vinegar, it becomes a tough and durable leather when soaked in tanning liquour. It is generally supposed that the "porpoise-hide" leather, found to be so excellent

a material for boots and laces, is made from the skin of the common porpoise. This is incorrect; it is made from the skin of this White Whale. In its natural state it is too thick for "uppers," but by ingenious machinery it is split and shaved down to any degree of thinness. In Canada and the United States this leather is also used for saddles and the hoods of carriages. Amongst the items in the Hudson's Bay Company's December catalogue are generally some lots of "porpoise-hides." As they are then on view previous to sale by public auction, any one who feels an interest in the subject may inspect them, and learn what kind of coat is worn by the beautiful cream-coloured whales that have lived in the Royal Aquarium, Westminster.*

HENRY LEE.

May 29th, 1878.

* A portion of the above appeared in "Land and Water."